The evolution of a corporate system: the case of production and employment structures in the Toyota Group*

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ABSTRACT

In this study, we explore the evolution of a corporate system by analyzing the case of production and employment structures in the Toyota Group. Our findings show that the production structure of the Toyota Group, which has been gradually affected by external, market, and institutional factors since the 1980s, transformed in 2009 from a domestic-oriented production structure to an overseas-oriented production structure. We also determined that since 2004, the domestic employment structure of the Toyota Motor Corporation has evolved to allow the flexible management of worker supply and demand through the hiring of nonregular workers, in response to the amendment to the Worker Dispatching Act. Consequently, the Toyota Group's production and employment structures have evolved to help secure channels that help the company flexibly adjust its output in response to abrupt economic fluctuations.

Keywords: Corporate System; Production and Employment Structure; Automobile Industry; Toyota Group; Evolutionary Transformation
JEL Classification Codes: D22, J21, L62

1 Introduction

Regulation theory is a useful analytical tool. It can be used to investigate the mechanisms that have influenced growth and crises in capitalism and explain how institutions and economic units act in such situations. The major institutional forms of capitalism—which affect regimes of accumulation, such as

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modes of regulation—can be classified into five categories.[1] According to regulation theory, the major institutional forms of capitalism are not spatially and temporally identical, but variable and diverse; therefore, the nature of various regimes of accumulation change, which leads to differences in modes of development and diversity and of evolution in capitalism. The evolution of Japanese capitalism through changes in institutions and regulations has been addressed by regulationist economists such as Boyer and Yamada (2000) and Uni (2009), while Amable (2003) and Hall and Soskice (2001) classify capitalism into various categories by undertaking comparative analyses based on diverse factors. Moreover, Yamada (1994) addresses the macroscopic features of the Japanese type of capitalism by examining a hypothesis regarding corporate-led regulation, and Kim (2014) attempts to explore the corporate system of the Hyundai Motor Group in South Korea from an institutional economics approach, based on the wage–labor nexus.

The main point we would like to emphasize here is that corporate systems evolve along with the diversity of capitalism, and with changes in time and space.[2] In this study, we therefore consider that perspectives on the evolution of corporate systems can be corroborated by theories vis-à-vis the evolution of capitalism, which are approached nationally, at the macro level, and through analyses of corporate systems that can stand mid-way between micro and macro-level approaches. To address the evolution of corporate systems, this study focuses on the case of the Toyota Group, and on how the group's production and employment structures have evolved. The first half of this paper presents an argument regarding the evolution of the Toyota Group's production structure, based on an investigation of the factors that have influenced its production structure and the reasons behind its evolution. Factors that have had decisive effects on the Toyota Group's changes in domestic output, overseas output, and export volumes are considered from various perspectives. Then, the current production structure at the Toyota Group is examined. The second half of this paper explains the type of employment structure that has evolved in the Toyota Motor Corporation (hereafter, TMC)—where the largest number of workers among the Toyota Group-affiliated automakers is employed—as well as the factors that affect change and the reason why the company's employment structure has evolved in this way. To do so, we explore the compositional changes in the TMC's body of employees, in terms of regular and nonregular

[1] "The regulation school has demonstrated that a viable economic regime derives from the compatibility of five major institutional forms; a wage–labor nexus, a configuration for competition, a monetary (and credit) regime, a set of state interventions, and finally an international regime" (Boyer and Hollingsworth, 1997, p. 192).

[2] Isogai (2012) presents arguments on the transformation of the Japanese corporate system and its evolution with regard to various aspects, such as the transformations of employment system and corporate finance, and evolution in diverse factors like product and monetary transactions, corporate governance reforms, and the like.

workers; analyze what has brought about a rapid increase in its percentage of nonregular workers, from institutional and economic points of view; and consider the effects of this increase on the company's production structure.

2 Evolution of production structure

In 2008, the Japanese automobile industry had the world's highest level of automobile production, even though it had been established later than similar industries in the United States, the United Kingdom, Germany, and France—all of which are considered leading countries in the automobile industry. The Japanese automobile industry is considered to have been founded when Nissan Motor Company began to systematically produce 1,000 of its Datsun vehicles each year, starting in 1935 (Suzuki, 1999). Thereafter, Japan continued to show remarkable progress and rapid advancement; 45 years later, in 1980, it became the top automobile-producing country in the world for the first time, surpassing the United States, with a record annual output of 11,042,884 vehicles.[3] After 2008, however, Japan relinquished its position to China, which has worked hard to become one of the fastest-growing automobile-producing countries in the world. Nevertheless, Japan's strength as a major automobile-producing country cannot be denied, and as of 2013, its position in the global ranking of annual output of automobiles (9,630,070 vehicles) was third, after China (22,116,825) and the United States (11,045,902).[4]

2.1 Changes in the production structure specialization index

As of 2013, Japan has 13 automobile manufacturing companies.[5] The Toyota Group, an international automobile-specialized group representing the Japanese automobile industry, owns three of these automakers; these companies are the TMC, which is in charge of passenger and commercial vehicle assembly; Daihatsu Motor Co., Ltd. (hereafter, DMC), which produces mini-vehicles; and Hino Motors, Ltd. (hereafter, HML), which manufactures commercial vehicles. The Toyota Group has actively led the Japanese automobile industry, producing the world's largest number of automobiles every year.[6] In 2007, the

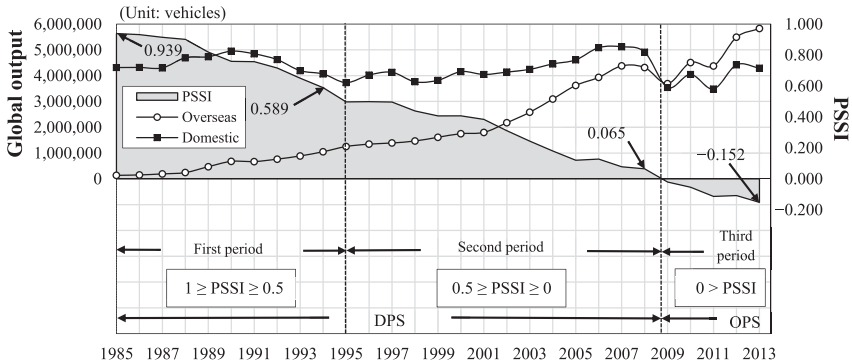
[3] These data are taken from Japan Automobile Manufacturers Association, Inc., *Motor vehicle statistics of Japan*, various years.

[4] These data are taken from Japan Automobile Manufacturers Association, Inc. (2014).

[5] These companies are Daihatsu, Fuji (Sabaru), Hino, Mitsubishi FUSO, UD Trucks (Nissan Diesel), Nissan, Honda, Isuzu, Mazda, Mitsubishi, Suzuki, Toyota, General Motors Japan.

[6] As of 2012, TMC was the world's largest producer of automobiles by volume (10,104,424 vehicles per year) (OICA, 2012).

Figure 1. Toyota Group's annual global output of automobiles and PSSI.



Notes: Data from the TMC, the DMC, and HML are included.
Sources: Japan Automobile Manufacturers Association, Inc., *Motor vehicle statistics of Japan* (2004–2013), *Monthly report on the Japanese automobile industry* (1986–2014); Toyota Motor Corporation (1988); Toyota Motor Corporation (2012).

Toyota Group recorded its highest level of domestic output of automobiles since its foundation in 1937, with 5,119,631 vehicles (including passenger and commercial vehicles) produced in its domestic plants (see Figure 1). This equates to 44.1% of the total domestic output of automobiles produced by all automakers in Japan—a very large and impressive amount. However, the Toyota Group's domestic output of automobiles, as of 2013, had greatly declined, to 4,290,652 vehicles; this decline was due to overall slack in the global automobile market in the aftermath of the 2008 global economic recession. Despite this, its domestic output of automobiles still accounts for 44.5% of the total domestic output of automobiles produced by all automakers in Japan.[7] On the manufacturing side, the Toyota Group has long maintained a set structure, and supplied its automobiles to both domestic and overseas markets while focusing on domestic rather than overseas production. This structure, however, has gradually evolved, due to the influence of various factors.

An analysis of the factors that have affected the evolution of the Toyota Group's production structure must focus on the nature of that structure. To undertake such an analysis, it is necessary to quantify changes in the

[7]As of 2013, the percentage of domestic output by each automaker in Japan has been as follows: Daihatsu, 8.0; Fuji (Sabaru), 6.6; Hino, 1.6; Mitsubishi FUSO, 1.0; UD Trucks (Nissan Diesel), 0.2; Nissan, 10.0; Honda, 8.7; Isuzu, 2.5; Mazda, 10.0; Mitsubishi, 6.1; Suzuki, 10.1; Toyota, 34.9; General Motors Japan, N/A; others, 0.01 (Japan Automobile Manufacturers Association, Inc., *Monthly report on the Japanese automobile industry*).

production structure so that they can be objectively understood; this can be done through the use of the production structure specialization index (hereafter, PSSI). The PSSI can be used to assess whether the Toyota Group's production structure focuses on domestic or overseas production facilities, and it can be calculated based on data provided in the Toyota Group-affiliated automakers' financial reports regarding the amount of overseas and domestic production from 1985 to 2013, as follows:

$$\mathrm{PSSI}_t = (\sum \mathrm{DP}_t - \sum \mathrm{OP}_t)/(\sum \mathrm{DP}_t + \sum \mathrm{OP}_t) \quad (t = 1985, \ldots, 2013)$$

where DP_t is domestic production in the year t and OP_t is overseas production in the year t.

A PSSI score that approaches 1 indicates a stronger domestic-oriented production structure (hereafter, DPS), while a score approaching –1 indicates a stronger overseas-oriented production structure (hereafter, OPS). The PSSI, as shown in Figure 1, can be used to identify the ways in which the Toyota Group's production structure has evolved. The most noticeable feature of the Toyota Group is that its PSSI seems to have consistently decreased, from 0.939 in 1985 to –0.152 in 2013; this means that the company's production structure has been quickly transforming from a DPS to an OPS.

Classifying the production structure of the Toyota Group by year, based on PSSI values, reveals three distinct periods. The first period, which consists of any time before 1994, can be described as the "maintenance period of the DPS" ($1 \geq \mathrm{PSSI} \geq 0.5$). In this period, the annual domestic output of automobiles overwhelmingly exceeded the annual overseas output, and so a DPS was firmly maintained. The second period, from 1995 to 2008, can be distinguished as an "escape period from a DPS" ($0.5 > \mathrm{PSSI} \geq 0$). During this period, on the one hand, the DPS remained, but on the other hand, as the continuously decreasing PSSI values suggest, the company's movement away from the DPS was accelerating. In terms of the company's average annual rates of increase in the domestic and overseas output of automobiles,[8] the former increased at a rate of 2.1%, whereas the latter increased at a rate of 10.0%, thus demonstrating a major gap. This is compelling evidence of the rapid transformation of the Toyota Group's production structure. As a consequence, in 2009, the Toyota Group entered the "transitional period to the OPS" ($0 > \mathrm{PSSI}$), when its annual overseas output of automobiles started to exceed its annual domestic output. The aftermath of the global economic recession during this period had a negative effect on the Toyota Group's output of automobiles, and resulted in a decrease in both its annual domestic and overseas output of automobiles. Nevertheless, the company's PSSI values have shown a decreasing tendency each year since then.

[8]The average annual increasing rate = $\left(\frac{V_{t_n}}{V_{t_0}}\right)^{\frac{1}{t_n - t_0}} - 1$, where V_{t_0} is the start value, V_{t_n} is the finish value, and $t_n - t_0$ is the number of period (months, years, etc.)

PSSI changes clearly reveal the production structure typology at the Toyota Group, and how it has gradually evolved away from a DPS and toward the maintenance of an OPS. The factors that have had an effect on this structural evolution include external, market, and institutional factors.

2.2 The establishment of overseas production facilities

The first production of Toyota Group vehicles by overseas affiliates began at *Toyota do Brasil LTDA*, with 489 vehicles in 1959. The Toyota Group has gradually expanded its overseas facilities over the past 50 years, and as a result of that expansion, as of 2013, its automobiles were being produced at 66 overseas production facilities in North and South America, Europe, and Asia; the 196,389 workers employed at all production facilities generated a total overseas output of 5,826,622 vehicles in that year (see Table 1). That the total number of workers employed at production facilities in Japan in that year was 72,504 indicates the large scale of the company's overseas production facilities.

The Toyota Group's automobiles have been directly produced in overseas production facilities since 1959, and the company continues to expand its overseas output every year; nonetheless, its production capacity at overseas production facilities was much lower before the 1980s. The Toyota Group has begun in earnest to establish overseas production facilities since the 1980s; for this reason, its overseas output has started to increase rapidly since the mid-1980s (see Figure 2). Table 1 shows periods of expansion in the Toyota Group's overseas production facilities within the 10-year time period, thus identifying expansion as being concentrated within a specific time period. Of all of the Toyota Group's 66 overseas production facilities that are currently in operation, nine began production between the 1950s and the 1970s, but 52 started between the 1980s and the 2000s. Thus, the establishment of overseas production facilities was concentrated in the 30 years between 1980 and 2010, which means that the Toyota Group's plan for transforming its production structure to the OPS was implemented in earnest in the 1980s and thereafter, and accelerated throughout the 1990s and 2000s.

There are various reasons as to why the Toyota Group has pushed forward since the 1980s with the transformation of its production structure into an OPS. The most prevalent of these is the Toyota Group's strategic choice to overcome factors that influence the output and export volume of automobiles produced in domestic production facilities, through the direct adjustment of output by overseas affiliates. If the company's automobile output derived solely from domestic production facilities in Japan, the burden of risk—such as unexpected declines in output or export volume—would be inevitable. This would motivate the Toyota Group to focus on building not only domestic but also overseas production facilities. As a result of this, the Toyota Group's produc-

Table 1. Expansion of the Toyota Group's overseas production facilities.

(Units: vehicles, persons, facilities)		Toyota Group			
		TMC	DMC	HML	Total
Production volumes in 2013	Overseas	5,535,196	271,060	20,366	5,826,622
	Domestic	3,356,899	774,949	158,804	4,290,652
	Total	8,892,095	1,046,009	179,170	10,117,274
No. of workers in facilities in 2013	Overseas	175,296	14,279	6,814	196,389
	Domestic	52,296	9,208	11,000	72,504
	Total	227,592	23,487	17,814	268,893
No. of overseas production facilities	1930s	– (1)	– (1)	– –	– (2)
	1940s	– –	– –	– (1)	– (1)
	1950s	1 (1)	– –	– –	1 (1)
	1960s	5 (3)	– (1)	– (1)	5 (5)
	1970s	3 (5)	– (2)	– –	3 (7)
	1980s	8 (2)	– (1)	3 (1)	11 (4)
	1990s	14 (2)[T]	2 –	2 –	18 (2)
	2000s	17 –	1 (3)[D]	5 –	23 (3)
	2010s	4 (1)[T]	– –	1 –	5 (1)
	Total	52 (15)	3 (8)	11 (3)	66 (26)

Notes:
1. Figures in parentheses refer to the number of domestic production facilities.
2. The number of workers in the TMC's facilities is based on data as of the end of December 2012; that in the DMC's, as of the end of June 2013; and that in the HML's, as of the end of March 2013.
3. ( )[T] is the number of wholly owned subsidiaries of Toyota Motor Corporation.
4. ( )[D] is the number of wholly owned subsidiaries of Daihatsu Motor Co., Ltd.

Sources: Toyota Motor Corporation, *Toyota in the world* (2004–2013); Daihatsu Motor Co., Ltd. (2013); Hino Motors, Ltd. (2013).

tion structure has quickly transformed from a DPS to an OPS. The acceleration of the production structure's transformation toward an OPS can also be seen in the fact that the company's 10 domestic production facilities in Japan were established between 1980 and 2013, whereas the 57 overseas production facili-

ties were established during the same period. These changes indicate that since 1980, the Toyota Group has concentrated on overseas investment in production facilities, rather than on the expansion of its domestic production facilities. Thus, the Toyota Group has increased the output of its overseas production facilities through the gradual transformation of its structure to an OPS, as shown in Figure 1.

The factors that have influenced its structural transformation can be classified into three groups, as discussed in the following sections.

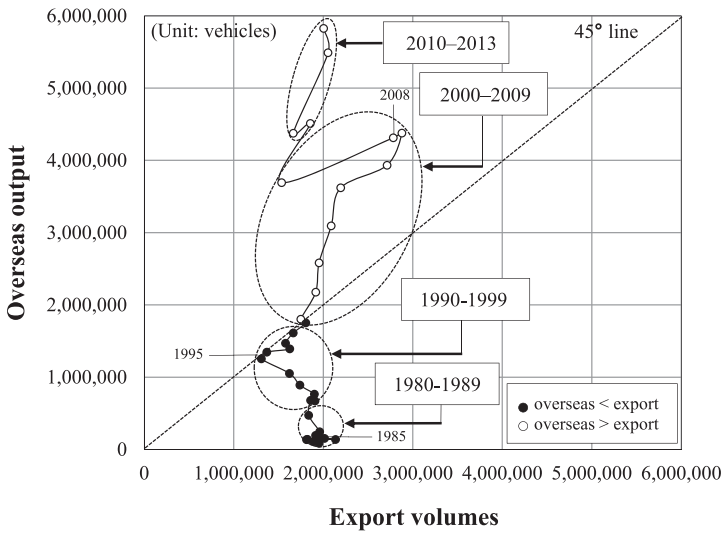
2.3 External factors

Drastic fluctuations in the US dollar (USD)–Japanese yen (JPY) exchange rate due to the sudden appreciation of the Japanese yen can be considered an external factor that has affected the evolution of the Toyota Group's production structure. Those drastic fluctuations,[9] which began in the late 1980s, were sparked by the Plaza Accord, led in September 1985 by the G5 advanced countries (France, West Germany, Japan, the United States, and the United Kingdom); this Accord resulted in both a planned US dollar depreciation and Japanese yen appreciation. Because of this appreciation, the Toyota Group has experienced an environment in which the export volumes of automobiles have been highly sensitive since 1985 to sharp exchange-rate fluctuations. Such an environment made the Toyota Group realize that changes in its automobile supplies to overseas markets could be more easily affected by external factors if its automobile output were fully dependent on domestic production facilities in Japan. Furthermore, these circumstances sufficed in impressing upon the Toyota Group the necessity of developing a practical alternative that would help it strategically adjust its output in response to the effects of diverse external factors. In coping with Japanese yen appreciation, the Toyota Group has had no choice but to promote overseas production and map out a strategy for building a global production network in both North America and Europe (Shimizu, 2003).

Since the mid-1980s, the Toyota Group has begun in earnest to establish a production structure that makes it possible to produce (and adjust its automobile supplies to overseas markets) at overseas production facilities. Figure 2 shows changes in the Toyota Group's overseas output and export volumes by year. The most noticeable thing is that its export volumes remained stable before 1985, but then entered a state of decline; since 1985, overseas output has steadily changed to follow an upward trend. This indicates that the decrease in export volumes caused by external factors was offset by an increase in overseas output at overseas production facilities. The annual overseas output of automobiles

[9] USD–JPY exchange rates: 246.89 (October 1, 1984), 214.84 (October 1, 1985), 156.04 (October 1, 1986), 143.48 (October 1, 1987), and 128.85 (October 1, 1988) (Source: Bank of Japan).

Figure 2. Toyota Group's overseas output and export volumes.



Notes:
1. Data from the TMC, the DMC, and HML are included.
2. Data cover the numbers of passenger and commercial vehicles.

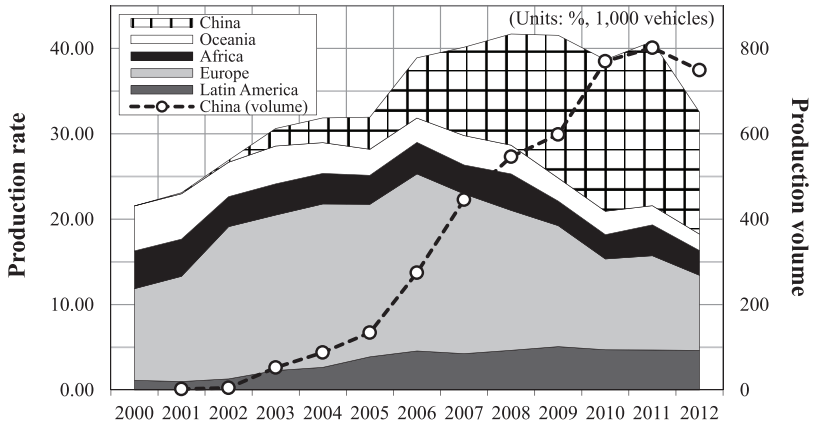
Sources: Japan Automobile Manufacturers Association, Inc., *Motor vehicle statistics of Japan* (2004–2013), *Monthly report on the Japanese automobile industry* (1981–2014); Toyota Motor Corporation (2012).

has overwhelmingly exceeded the annual export volumes of automobiles, due to a gradual increase in overseas output since 2001; therefore, the Toyota Group's automobile-supply structure for overseas markets has fully transformed from an export-led supply structure to an overseas production-led supply structure.

Another external factor that pushed the structural transformation of the Toyota Group was the structural change in the 1990s in China's automobile industry. In 1994, the Chinese government designated the automobile industry as one of its "pillar industries," with the intention that it would drive the national economy, alongside other industries[10] (Holweg *et al.*, 2009). The Chinese government also announced its "industrial policy for the automobile industry," which reflected its intention to develop and consolidate China's indigenous automobile industry (Wang, 2003). The ultimate aim of this policy was to promote market concentration and industrial restructuring within China's automobile industry (Chu, 2011). Through this policy, the Chinese government attempted

[10] "It was reasoned that the development of an automotive industry would encourage Chinese enterprises in many sectors to specialise and coordinate their efforts better" (Holweg *et al.*, 2009, p. 81).

Figure 3. TMC's overseas production in China.



Notes:
1. Production rates are calculated by the author.
2. Domestic production volume is excluded from the production rate calculations.
Source: Toyota Motor Corporation, *Toyota in the world* (2004–2013).

to gradually change the structure of the country's automobile industry, from a market-protection-based structure to one that promoted market competition. As a result of China's industrial policy with regard to the automobile industry, the investment environment in China become a more aggressive one for foreign automakers, and it led to the establishment of many joint ventures.[11] Such investment environment changes in China helped push the Toyota Group to focus on its capabilities in the Chinese automobile market; it also served as momentum in expanding its production facilities to China prior to entering the China market—one where there is a large purchasing demand for new automobiles.

As of 2013, the Toyota Group was operating 11 production facilities in China (TMC: nine facilities, HML: two facilities); four began production in the mid-1990s, and seven in the 2000s. In the case of the TMC—which owns the largest number of production facilities in China—its production facilities have gradually expanded in China since the mid-1990s. It stands to reason, then, that output among its Chinese production facilities has rapidly increased since the early 2000s, as shown in Figure 3. During the 2001–2012 period, the TMC's annual output of automobiles from its Chinese production facilities increased

[11] These include, for example, Shanghai General Motors Company Ltd. (January 12, 1997), Guangqi Honda Automobile Co., Ltd. (July 1, 1998), Tianjin FWW Toyota Motor Co., Ltd. (June 2000), Dongfeng Nissan Ltd. (June 16, 2003), and Beijing Benz Automotive Co., Ltd. (August 8, 2005).

from 2,178 to 749,200; these numbers, as a percentage of the company's production worldwide, has also increased, from 0.12% to 14.29%. The increases in both automobile output and percentage of production indicate that the transformation of the Toyota Group's production structure accelerated during this period.

In short, the two aforementioned events, both of which were external factors, stimulated the evolution of the Toyota Group's production structure; furthermore, it sufficed in actually *accelerating* its evolution. Therefore, we can conclude that the exit strategy—which aimed to minimize the Toyota Group's continuous decline in export volume and mitigate its loss of export competitiveness, created in turn by the Japanese yen's appreciation in the mid-1980s—triggered the transformation of its production structure toward an OPS. We can also conclude that the Toyota Group's investment strategy within China, which changed in response to structural changes in China's automobile industry in the mid-1990s, accelerated that evolution.

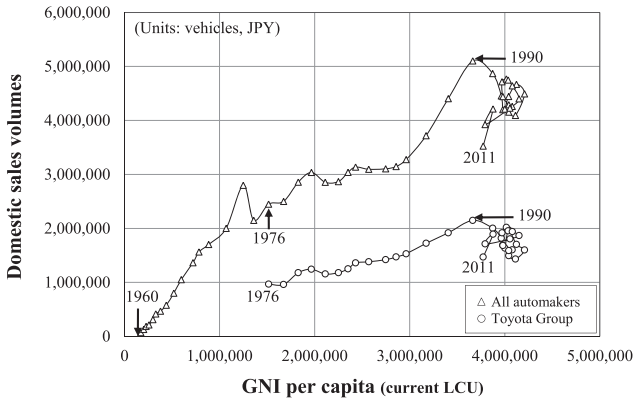
2.4 Market factors

The appreciation of the Japanese yen continued for 10 years after the Plaza Accord, and the USD–JPY exchange rate finally fell to its lowest point on April 1, 1995 (JPY83.53 per USD1.00).[12] Thereafter, the rate began to rise again. However, even as fluctuations in the exchange rate have been stabilizing with this ongoing rise, the Toyota Group has continued to accelerate its efforts to transform its production structure into an OPS, through gradual expansions in its overseas production facilities. What made the Toyota Group continue to accelerate the transformation of its production structure in the 1990s and 2000s was affected not only by external factors, but also by market factors. Purchasing demand saturation in Japan's domestic automobile market can be highlighted as a market factor that has effected how quickly the Toyota Group's production structure has changed.

Figure 4 shows the total domestic sales volumes of passenger vehicles in Japan, domestic sales volumes of the Toyota Group's passenger vehicles, and Japanese gross national income (GNI) per capita in JPY. As shown in Figure 4, the total domestic sales volumes of passenger vehicles in Japan and the domestic sales volumes of the Toyota Group's passenger vehicles steadily increased until 1990. The driving force stimulating the domestic passenger vehicle market in Japan, beyond the expansion of market scale before 1990, was the steady increase in national income among the Japanese people, which stemmed from rapid economic growth in Japan throughout the 1970s and 1980s that drove purchasing demand. This is evidenced by the fact that as Japan GNI per capita

[12] These data are taken from the Bank of Japan.

Figure 4. Annual domestic sales volumes of passenger vehicles in Japan and Japanese GNI per capita.

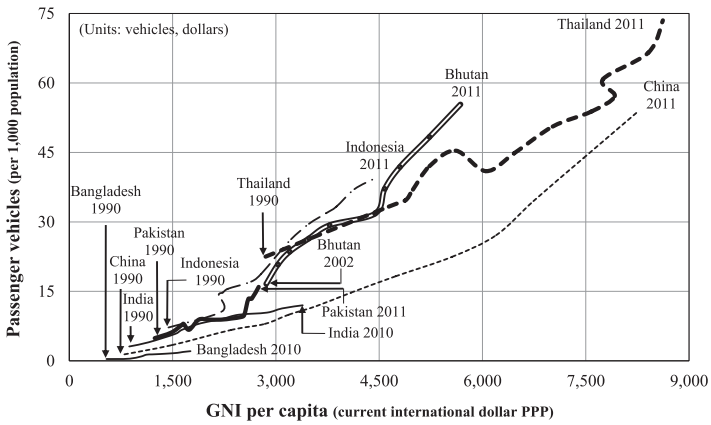


Notes:
1. The total domestic sales volumes of passenger vehicles in Japan, from 1960 to 1966, are based on fiscal years. For example, the year 1961 means the year from April 1960 to March 1961.
2. The total domestic sales volumes of passenger vehicles in Japan and domestic sales volumes of the Toyota Group's passenger vehicles, from 1967 to 2011, are based on each calendar year from January to December.
3. Data from HML, which does not produce passenger vehicles, are excluded.
Sources: Japan Automobile Manufacturers Association, Inc., *Motor vehicle statistics of Japan* (2004–2013), *Monthly report on the Japanese automobile industry* (1967–2012); World Bank, *World Bank national accounts data;* Organisation for Economic Co-operation and Development, *OECD National accounts data files.*

in JPY continued to gradually increase until the early 1990s, the total domestic sales volumes of passenger vehicles in Japan and domestic sales volumes of the Toyota Group's passenger vehicles also increased overall. However, since 1990, these figures have entered a state of decline—even though the level of GNI per capita in Japan has remained high, at roughly JPY4 million. This means that Japan's passenger vehicle market—which has entered a mature diffusion stage—has reached a saturation point by already attaining a certain level of annual purchasing demand for new passenger vehicles. In other words, it is apparent that the annual purchasing demand for new passenger vehicles in Japan's domestic market is limited in terms of how much it can increase.

For the Toyota Group, this state of demand saturation has contributed since the 1990s to a quickened transformation in its production structure, toward an OPS. Since in this period domestic market demand entered a phase during which it could be met by domestic production facilities, the Toyota Group concentrated its efforts on investing in overseas facilities and exploring overseas markets, rather than on expanding domestic production facilities.

Figure 5. Changes in passenger vehicle ownership and GNI per capita among Asian countries.



Sources: World Bank, *World Bank national accounts data, International Comparison Program database;* United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *Statistical Yearbook for Asia and the Pacific*; International Road Federation, *World Road Statistics and data files*.

Along with saturation of demand for domestic passenger vehicles in Japan, the diffusion of passenger vehicles into Asian households—facilitated by their increased incomes—is another market factor that has had a decisive effect on the evolution of the Toyota Group's production structure. Unlike with Japan's passenger vehicle market—for which purchasing demand reached its uppermost limit starting in the early 1990s—domestic passenger vehicle markets in Asian countries like China, India, Thailand, Indonesia, Pakistan, Bangladesh, and Bhutan are still expanding. Increases in income brought about by gradual economic growth continues to foster the domestic passenger vehicle market in those countries that have not yet entered a mature diffusion stage with regard to passenger vehicles. Figure 5 shows the changes in passenger vehicle ownership in various Asian countries, as well as changes in their GNI per capita, from 1990 to 2011. In the year 1990, passenger vehicle ownership stood at 1.4 vehicles per 1,000 members of the population in China, 3.1 in India, 7.2 in Indonesia, 4.9 in Pakistan, 0.4 in Bangladesh, 16.6 in Bhutan (in 2002), and 22.5 in Thailand; these are generally low levels. However, the historical data of these countries indicate that the more GNI per capita increases, the more passenger vehicle ownership increases. In 2011, as GNI per capita continued to gradually increase, passenger vehicle ownership per 1,000 members of the population increased steeply, reaching 53.6 vehicles in China, 12 in India (in 2010), 39.4 in Indonesia, 15.9 in Pakistan, 2 in Bangladesh (in 2010), 55.3 in Bhutan, and 73.5 in Thailand. These data indicate that in these countries, the diffusion of passenger vehicles on

account of increased income is progressing at a rapid pace. This can be considered a contributing factor to the Toyota Group's expansion of its business field into the emerging Asian automobile market, where there is a large purchasing demand for new passenger vehicles; it can also be considered a catalyst in the transformation of the Toyota Group's production structure into an OPS.[13]

2.5 Institutional factors

Institutional factors must not be overlooked, as they too have had a great effect on how quickly the Toyota Group's production structure has transformed. One such factor has been voluntary export restraints (hereafter, VERs).[14] VERs were announced by Japan's Ministry of International Trade and Industry (hereafter, MITI) on May 1, 1981; they are restrictions through which Japan voluntarily controls specific export volumes by keeping them below a certain level, to prevent excessive exports. The MITI specifically set limitations on the export volumes of Japanese automobiles to the US market. Initially, these VERs limited the export volumes of passenger vehicles to 1.68 million in 1981; that limit was gradually increased to 2.3 million by 1992.[15] The MITI also gave each Japanese automaker a separate sub-quota volume of export limits, based on past sales (Berry *et al*., 1999; Feenstra, 1984).

The background of the implementation of VERs by the MITI bears a direct relation to local content laws. In the early 1980s, the United States experienced economic stagnation, as well as encroachment on its domestic automobile market by Japanese automakers, powered by their increased exports. The United States felt threatened by Japanese automakers, and induced them to withdraw from the US market in order to protect the domestic automobile industry by applying local content laws. These laws made it compulsory for automakers selling their automobiles in the US market to use a certain percentage of American auto parts. The laws indirectly pushed the Japanese government to force the MITI to voluntarily limit Japanese automakers' export volumes to the US market. Especially, VERs and local content laws also had a considerable effect on the TMC, whose export volumes of automobiles to the US market accounted for more than

[13] The fact that 33 of the Toyota Group's 66 overseas facilities are established in Asian countries stands as compelling evidence of these assertions.

[14] "Voluntary export restraints (VER) are arrangements between exporting and importing countries in which the exporting country agrees to limit the quantity of specific exports below a certain level in order to avoid imposition of mandatory restrictions by the importing country. The arrangement may be concluded either at the industry or government level" (OECD, 2008, p. 582).

[15] When exports to Puerto Rico and sport utility vehicles (SUVs) are included, the figure for 1999 increases to 1.8325 million, while that for 1992 increases to 2.506 million (Berry *et al.*, 1999).

50%[16] of the company's total export volume in the early and mid-1980s; these events promoted the transformation of the TMC production structure into an OPS.[17] On the whole, institutional coordination by the MITI—which proceeded from trade conflicts between the United States and Japan—influenced the production structure of the Toyota Group, and motivated the company to change it. The evolution of the Toyota Group's production structure into an OPS helped it supply automobiles to the overseas market, as this structure strengthened its ability to directly produce them at overseas production facilities.

2.6 Limitations or constraints on the evolution of production structure

As explained in the previous sections, empirical data reveal that the production structure of the Toyota Group is evolving in response to diverse external, market, and institutional factors (see Figure 6). It is obvious that the Toyota Group's production structure has been evolving into an OPS; nonetheless, some factors have limited or otherwise constrained its evolution. In discussing the evolution of the company's production structure, it is essential to consider these factors. Such limitations or constraints are particularly relevant to the special skill-formation system within the Toyota Group, which could be a core factor in the Toyota Production System (hereafter, TPS).[18] TPS—which strives for the absolute elimination of waste and is grounded in the basic ideology of *kaizen*, or continuous improvement—is a unique production system within the Toyota Group that works to accomplish stability of quality, reduce stock, and reduce production lead time by modifying automobile manufacturing techniques on the shop floor where workers operate machines, rather than by innovating its manufacturing techniques. Therefore, the TMC accords great importance to skills formation among those workers who are practically in charge of automobile production on the shop floor, because its automobile manufacturing techniques are fundamentally embodied not in engineers but in workers (Monden, 2012). Ultimately, the TMC embraces a system in which the special skill-formation toward the full use of a worker's capabilities on the shop floor plays an important role. Therefore,

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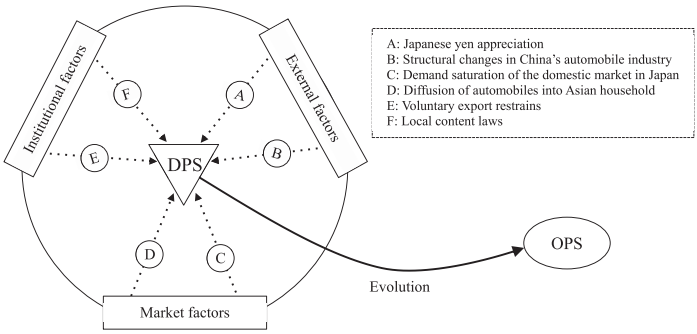
[16]Between 1980 and 1988, the TMC's exports to the US market had been kept to between 53.5% and 56.8% of all its exports (source: calculated by the author, using data from the *Annual securities report* of the Toyota Motor Corporation).

[17]The fact that nine of TMC's 52 overseas production facilities are located in the United States—and that eight of these were established after 1980—is compelling evidence that supports this assertion.

[18]See Monden (1983, 2012). "The Toyota Production System (TPS) was established based on two concepts: The first is called '*jidoka*' which means that when a problem occurs, the equipment stops immediately, preventing defective products from being produced; the second is the concept of 'Just-in-Time,' in which each process produces only what is needed by the next process in a continuous flow" (Toyota Motor Corporation, 2013).

Figure 6. Diverse factors affecting the evolution of the Toyota Group's production structure.



Source: Constructed by the author.

there would be limitations or constraints on the smooth operation of TPS under conditions in which the Toyota Group does not have a fully functional system for forming and fostering special skill-formation, such as training line workers as multi-skilled workers,[19] the creation of quality-control circles,[20] or the instituting of a suggestion system.[21] Furthermore, such limitations or constraints can potentially act as stumbling blocks in the evolution of the Toyota Group's production structure—that is, a TPS operated by workers with no systematic accumulation of special skills will naturally encounter limitations: not only do workers on the TPS shop floor need to become multi-skilled workers (i.e., versatile in various types of automobile-related work), but they should also be in charge of quality control and automobile assembly. In this sense, it cannot be denied that, ultimately, there is the possibility of partial limitations or constraints on the nonregularization of employment and on the enlargement of overseas production—conditions under which it is difficult for workers to accumulate special skills. For that reason, exploring compatibility among the nonregularization of employment, the

[19]The workers on the TPS shop floor have the capability to operate various machines, repair machines, and replace machine tools for work preparation.

[20]"A quality control circle, or QC circle, is a small group of workers that study quality control concepts and techniques spontaneously and continuously in order to provide solution to problems in their workplace" (Monden, 2012, p. 421). What TPS emphasizes is that all members of the Toyota Group need to take responsibility for product quality; therefore, a quality control circle is not solely a quality management department-based activity, but a worker-based activity.

[21]"At Toyota, however, both the purpose and spirit of its suggestion system are expressed in the slogan: 'Good products, good ideas'—that is, its goal is to draw upon the ideas of all employees in order to improve product quality and reduce cost so the company can continue to grow in the world automobile market" (Monden, 2012, p. 413).

enlargement of overseas production, and the special skill-formation system in the Toyota Group must be made a priority. Therefore, to maximize compatibility in the midst of such circumstances with a gradual increase in overseas production, there is a need to introduce new systems that help foster and accumulate special skill-formation among foreign and nonregular workers, in tandem with modifications or improvements to the Toyota Group's existing system. It should not be overlooked that if the production structure in the Toyota Group were to continuously evolve into an OPS that is stronger than the one now in place, without considering such compatibility, there would be the possibility of structural problems not seen in the DPS, as well as a failure to overcome limitations or constraints that may crop up in the evolutionary process.

3 The evolution of employment structure

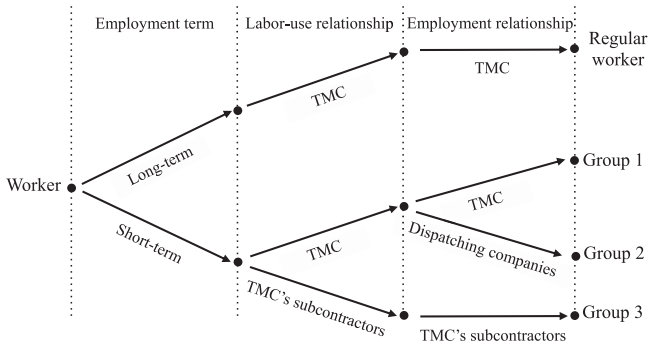
From a macro-level perspective, the Toyota Group is strategically coordinating its output through 26 domestic production facilities and 66 overseas production facilities. However, from the micro-level viewpoint, it is still unclear what fundamental tool, when used, would enable the Toyota Group to flexibly adjust its output. Therefore, it is necessary to discuss what adjustment channel can support the flexible control of the Toyota Group's output. This can be approached through an empirical analysis of data on aspects such as the composition of regular and nonregular workforce, its rate of change, and the wage–labor nexus, all of which support changes in employment structure. To carry out this analysis, the effects of changes in institutional factors on the employment structure should be considered, and the effects of changes in employment structure on output adjustment should also be explored.

Among the Toyota Group-affiliated automakers, the TMC in Japan—where the largest number of workers is employed—would be a suitable case for demonstrating the relationship between employment-structure change and output adjustment. This particular relationship has been clearly highlighted on account of changes to the Japanese labor system since 2004; therefore, it is important to analyze how the TMC's domestic employment structure is different before and after 2004, and why its domestic employment structure evolved in that way. Furthermore, this analysis provides vital clues for understanding the evolution of the Toyota Group's corporate system from a variety of perspectives.

3.1 The TMC's domestic employment structure: regular and nonregular workers

The TMC's domestic employment structure can be analyzed from various perspectives, based on how workers are classified and what kinds of standards are used. However, an analysis of the TMC's employment structure should focus

Figure 7. The TMC domestic employment structure.



Source: Constructed by the author.

on whether or not workers there are employed as regular workers, as this is conducive to uncovering the company's channel of output adjustment. In the case of the TMC, regular workers are those who hold with the TMC long-term employment contracts that offer them job security. Nonregular workers, on the other hand, can be divided into three different groups, based on their employment contracts. Group 1 workers are short-term workers who directly sign with the TMC employment contracts that extend for several months. Casual workers (i.e., temporary workers), part-time workers, and seasonal workers who are mainly in charge of manufacturing responsibilities are also included in group 1. Workers belonging to group 2 do not make direct employment contracts with the TMC; rather, they are employed by worker-dispatching companies,[22] work at the TMC, and are involved in manufacturing. Finally, the workers belonging to group 3 are subcontract workers who directly make employment contracts with the TMC's subcontractors. These workers take orders from TMC subcontractors and are involved in some aspects of the TMC's manufacturing activities.

The worker categories in this standard of classification are basically delineated according to employment and labor-use relationships, as shown in Figure 7. Regular and nonregular workers in group 1 are engaged with the TMC in both employment relationships and labor-use relationships. Workers in group 2 are in employment relationships with worker-dispatching companies, but in labor-use relationships with the TMC. Workers belonging to group 3

[22]These companies include Nisso Corporation (http://www.nisso.co.jp/), Nikken Sogyo Co., Ltd. (http://www.nikken-sogyo.co.jp/), Technosmile, Inc. (http://www.technosmile.co.jp/), and Miyauchi Kousan Group Co., Ltd. (http://www.miyauchikousan-g.co.jp/).

are in both employment relationships and labor-use relationships with TMC subcontractors. According to Komatsu (2005), the TMC's employment patterns and systems have not taken a fixed form, but rather have evolved in accordance with the company's diverse purposes and situations as time passes; their characteristics have also changed based on environmental changes.

3.2 The evolution of employment structure led by institution: the amended Worker Dispatching Act

According to the TMC's *Annual securities report*, as of the end of March 2013, the company's number of regular workers was 68,978, while nonregular workers belonging to groups 1 and 2 numbered 9,320. It is difficult to clarify the number of subcontracted workers belonging to group 3; the approximate size of the group 3 workforce can be estimated only by understanding the number of dispatched or subcontracted workers involved in the manufacture of transportation equipment (i.e., companies with more than 300 workers) in Aichi prefecture, where the TMC's 12 existing domestic production facilities are located. The remainder of this paper thus presents arguments regarding the transformation of the TMC's employment structure, by defining the workers who belong to groups 1 and 2 as the company's nonregular workers.

Table 2 shows the number of regular workers (A), number of nonregular workers (B), and percentage of nonregular workers (C) at the TMC. The most noticeable feature of the data in this table is that the TMC's employment structure before 2004 was such that nonregular workers accounted for less than 10% of all regular workers; meanwhile, since 2004, the number of nonregular workers has consistently exceeded 10% of the number of regular workers.[23] These findings indicate that the TMC's employment structure at one point transformed due to the influence of a specific factor. This was likely an institutional factor, and we suggest that it was in fact an amendment to the Worker Dispatching Act.

The amended Worker Dispatching Act was passed on June 6, 2003, and it came into effect on March 1, 2004. The major amended content of this act is that dispatched workers, in principal, would be allowed to be employed in all aspects of a business's affairs for up to three years, and could be employed in manufacturing processes within the manufacturing sector; these two provisions were forbidden prior to the amendment.[24] As a consequence, after the amendment,

[23] The TMC does not disclose its numbers of workers belonging to groups 1 and 2 in years when they represent less than 10% of the regular workforce. As such, this study uses the figure of 10% for these workers in years when they comprise less than 10% of the regular workforce (i.e., 2001–2003).

[24] See 2 of Article 40 and Supplementary provisions of the amended Worker Dispatching Act (Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers), Act No. 88 of July 5, 1985.

Table 2. Changes in the numbers of workers at the TMC.

(Units: A, B: persons; ΔA, ΔB, C: %)		Regular workers		Nonregular workers		
	Year	**A**	**ΔA**	**B**	**ΔB**	**C**
Before amendment	2001	66,005	1.1	6,600*	1.1*	10*
	2002	66,820	1.2	6,682*	1.2*	10*
	2003	65,551	–1.9	6,555*	–1.9*	10*
After amendment	2004	65,346	–0.3	8,147	24.3	12.5
	2005	64,237	–1.7	16,913	107.6	26.3
	2006	65,798	2.4	19,164	13.3	29.1
	2007	67,650	2.8	18,154	–5.3	26.8
	2008	69,478	2.7	17,651	–2.8	25.4
	2009	71,116	2.4	14,092	–20.2	19.8
	2010	71,567	0.6	8,725	–38.1	12.2
	2011	69,125	–3.4	8,753	0.3	12.7
	2012	69,148	0.0	9,139	4.4	13.2
	2013	68,978	–0.2	9,320	2.0	13.5

Notes:
1. A, B: the number of workers; ΔA, ΔB: variations year-on-year; C: the ratio of nonregular workers.
2. The number of nonregular workers from 2001 to 2003 is assumed to be 10% of regular workers.
3. * stands for estimated figures.
4. The number of nonregular workers represents the annual average.

Source: Toyota Motor Corporation, *Annual securities report,* from 2001 to 2013.

the number of dispatched workers in the manufacturing sector increased rapidly. As shown in Table 3, in 2001 and at companies in Aichi prefecture employing more than 300 workers, dispatched or subcontracted workers in the transportation equipment manufacturing sector comprised only 5.8% (9,096 workers) of all workers. However, in 2006, this figure increased to 11.9% (22,085 workers) as a result of the increased number of dispatched workers. In addition, as shown in Table 2, the percentage of nonregular workers at the TMC was also less than 10% of the total number of regular workers in the 2001–2003 period, but it gradually increased to 29.1% by 2006; this change was made possible by the amendment to the Worker Dispatching Act. These findings indicate that dispatched workers'

Table 3. Changes in the numbers of workers in Aichi prefecture (manufacturers of transportation equipment).

(Units: persons, %)		1996	1999	2001	2004	2006
Dispatched or subcontracted workers	Male	8,641	–	7,674	11,655	18,578
	Female	941	–	1,422	2,106	3,507
	Total (A)	9,582	9,577	9,096	13,761	22,085
Employees	Male	153,320	–	143,922	152,931	168,138
	Female	16,994	–	14,220	15,156	17,533
	Total (B)	170,314	154,898	158,142	168,087	185,671
(A)/(B) × 100		5.6%	6.2%	5.8%	8.2%	11.9%

Notes:
1. All data are based on companies with more than 300 workers each.
2. The numbers of dispatched or subcontracted workers are those from other organizations.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications, *Establishment and Enterprise Census*.

participation in certain aspects of manufacturing at the TMC increased when the prohibition of the use of dispatched workers in the manufacturing sector was repealed in 2004; clearly, this amendment led to changes in the TMC's employment structure, pushing it to evolve into something new and different.

3.3 The flexible supply and demand of nonregular workers

The 2004 amendment to the Worker Dispatching Act has led to a noticeable increase in the number of nonregular workers at the TMC. As mentioned, in 2003—when the amendment had not yet passed—nonregular workers represented less than 10% of regular workers; however, this number greatly increased following the amendment and the related annulment of prohibitions on the use of dispatched workers in the manufacturing sector. However, as shown in Table 2, this high percentage of nonregular workers has not been stable over time, and showed a rapid downward trend during a specific period. The percentage of nonregular workers remained between 19.8% and 29.1% between 2005 and 2009, but declined to 12.2% in 2010 and then remained relatively stable at 13.5% in 2013. The fact that rapid changes in the percentage of nonregular workers have occurred within such a relatively short time period indicates that the supply and demand of workers at the TMC has been managed flexibly through the use of nonregular workers. This can be verified by considering how

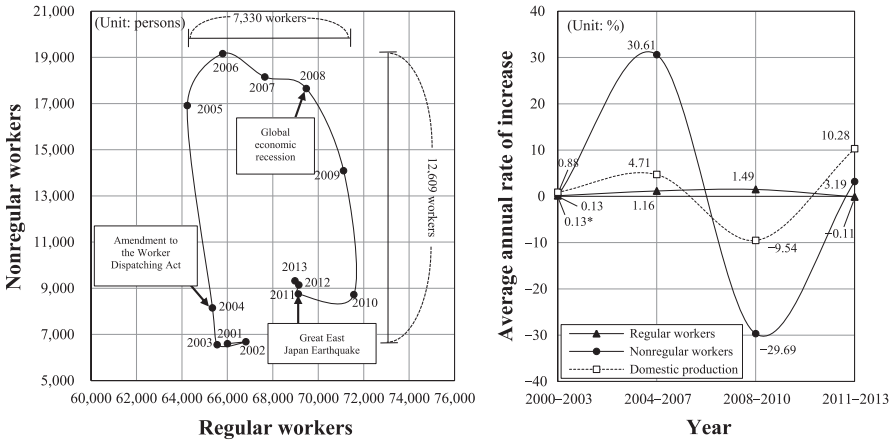
the supply and demand of regular workers, as well as that of nonregular workers, changed after the amendment to the Worker Dispatching Act.

Table 2 shows the year-on-year rate of change in the numbers of regular workers (ΔA) and nonregular workers (ΔB). What stands out conspicuously is the fact that ΔB changes drastically between 2004 and 2010. By looking in detail at ΔB by year, one finds that it increased by 107.6% in 2005—its highest rate of increase—and by 13.3% in 2006. On the other hand, ΔB decreased between 2007 and 2010, declining steadily, by –5.3% in 2007, –2.8% in 2008, –20.2% in 2009, and –38.1% in 2010. In 2004, the number of nonregular workers was 8,147, but two years later, in 2006, it increased to 19,164; four years later, in 2010, it decreased to 8,725. This trend of dramatic increases and decreases in the number of nonregular workers over a short time indicates that the supply and demand of nonregular workers was managed flexibly at the TMC. This raises the question of what makes it possible for the supply and demand of the TMC's nonregular workers to be so flexible. The answer involves the short employment cycle of dispatched workers. More specifically, the flexible discharge and employment of dispatched workers can be easily done, because the employment of dispatched workers in the manufacturing sector is limited to a maximum of three years, as stipulated in the amendment to the Worker Dispatching Act. As a result of this amendment, the TMC is able to flexibly manage the supply and demand of workers by employing dispatched workers who have short employment cycles.

With regular workers, however, there are limits to the flexibility of supply and demand. Because regular workers' job security is based on guaranteed long-term employment contracts—unlike dispatched workers (group 2), who have a maximum three-year dispatched work period, and short-term employment-contracted workers (group 1) who make employment contracts that last only for several months—flexibility in managing the supply and demand of regular workers is limited.[25] In 2004, when the amended Worker Dispatching Act came into effect, the number of regular workers at the TMC was 65,346—a decrease of 205 workers from the previous year—but it is difficult to determine whether this decrease stemmed entirely from the enforcement of the amended act. In 2005, when the TMC hired 8,766 more nonregular workers than in previous years, the number of regular workers was 64,237, representing a decrease of 1,109 workers in comparison to the previous year. Again, however, it is not certain that this decrease resulted from the increase in nonregular workers: indeed, since 2006, despite the amendment to the Worker Dispatching Act, the number of regular workers at the TMC has continually increased, regardless of the number of nonregular workers hired or fired. Table 2 shows that ΔA increased by 2.4% in 2006, by 2.8% in 2007, by 2.7% in 2008, by 2.4% in 2009, and by 0.6% in 2010. The most important fact that can be understood from this is that,

[25]The average duration of employment among the TMC's regular workers as of 2013 was 15.5 years (Source: Toyota Motor Corporation, *Annual securities report*).

Figure 8. Changes in domestic output and the number of workers at the TMC.



Notes:
1. Subcontracted workers (group 3) are not shown.
2. * indicates estimated figures.
3. The average annual increasing rate is calculated by the author.

Sources: Japan Automobile Manufacturers Association, Inc., *Motor vehicle statistics of Japan* (2004–2013); Toyota Motor Corporation, *Annual securities report* (2001–2013).

over the same period, the number of regular workers at the TMC has been more stable than that of nonregular workers.

All things considered, the fact that ΔA has generally shown a more stable yearly trend than ΔB indicates that the supply and demand of regular workers is less flexible than that of nonregular workers. This makes it necessary to consider why the TMC has attempted to transform its employment structure by taking a flexible approach to the supply and demand of nonregular workers.

3.4 The channel of output adjustment: nonregular workers

With the amendment to the Worker Dispatching Act, the TMC has been able to ensure a degree of flexibility in its employment of workers; the company was thereafter able to establish an employment structure that allows a flexible supply of dispatched workers to meet labor demand. As a result, the TMC has been able to cope with economic fluctuations, and making output adjustments by leveraging flexible employment has become much easier for the company. The TMC's approach is to partially use nonregular workers with short employment cycles as a channel of output adjustment. Figure 8 shows the relationship between changes in the TMC's domestic output and changes in the numbers

of its regular and nonregular workers. To understand the correlation between domestic automobile output and the employment structure, it is important to classify the factors of influence between 2000 and 2013, based on three major events: the amendment to the Worker Dispatching Act in 2004, the global economic recession in 2008, and the Great East Japan Earthquake of 2011.

During the 2004–2007 period, the number of nonregular workers at the TMC noticeably increased, as did the domestic output of automobiles. During this period, the average annual increase in domestic automobiles output was 4.71%, while there was a 1.16% increase in regular workers and a 30.61% increase in nonregular workers. This indicates that the increases in domestic output were more strongly linked to increases in the number of nonregular workers than to increases in regular workers.

In contrast, during the 2008–2010 period, the number of nonregular workers rapidly decreased alongside the company's domestic automobiles output, the latter of which was caused by the global economic recession. During this period, the average annual change in domestic automobile output was –9.54%, that of regular workers was 1.49%, and that of nonregular workers was –29.69%. These numbers indicate that the decrease in domestic output was strongly linked to a decrease in the number of nonregular workers.

Finally, for the 2011–2013 period, as the economy recovered from the adverse effects of the Great East Japan Earthquake, both the number of nonregular workers and domestic automobile output gradually increased. During this period, the average annual increase in domestic automobile output was 10.28%; at the same time, the decrease in regular workers was 0.11% and the increase in nonregular workers was 3.19%. These numbers indicate that the increase in domestic output was strongly linked to an increase in the number of nonregular workers.

Considering these correlations between domestic automobile output and the employment structure, it becomes clear that patterns of variation in the number of nonregular workers are similar to those regarding domestic automobile output, whereas patterns in the number of regular workers are not. Therefore, we can conclude that the TMC's nonregular workers act partially as a channel of output adjustment. It is thus likely that the TMC partially addresses adjustments in domestic output, as prompted by economic fluctuation, by managing the supply and demand of nonregular workers. Ensuring the flexibility of its employment structure by employing a varying percentage of nonregular workers is economically advantageous to the TMC, as it enables the company to flexibly adjust its output within a measureable amount of time and in response to abrupt economic fluctuations. For this reason, the TMC has maintained this employment structure.

3.5 The channel of labor cost-cutting: nonregular workers

The TMC has been trying to strategically and aggressively capitalize on the use of nonregular workers as a channel by which to adjust output in response to economic fluctuations. However, it is difficult to imagine that the flexible

management of labor supply and demand is the only advantage that has led the TMC to use nonregular workers in manufacturing.

It is clear that the evolution of production and employment structures has also been considerably affected by a need in recent years to cut costs. Business concerns, including those of the TMC, prioritize profit maximization through cost-cutting. Employment structures in businesses generally evolve to bring about cost-cutting goals, and it can be said that the TMC's current employment structure cuts labor costs in some ways by employing nonregular workers.

At the root of the TMC's approach to cutting labor costs is the wage disparity that exists between regular and nonregular workers, in spite of the fact that they do the same work. This wage disparity can be verified by undertaking comparisons between the two groups in terms of a number wage items—the clearest of which is base wages. The base wage of regular workers working on the TMC assembly lines is USD19.34 per hour, and that number rises to USD20.49 per hour after adding various bonuses. The base wage of nonregular workers working on the TMC assembly lines is USD11.05 per hour—which is already much lower than that of regular workers—and it increases to only USD12.13 per hour when bonuses are included (National Labor Committee, 2008). The disparity in hourly base wages (excluding bonuses) between the two groups is thus USD8.29, meaning that nonregular workers working on the TMC assembly lines receive only 57.1% of the regular workers' hourly base wage. By simply calculating that the total number of nonregular workers at the TMC in 2008 was 17,651, we can speculate that the company saved approximately USD146,326.79 of labor cost per hour by hiring nonregular workers instead of regular workers. When the wage disparities in various bonuses and allowances are also considered, the savings are further increased.[26]

To meet output goals and maximize labor cost-cutting, the TMC has also been trying to capitalize further on the flexible use of nonregular workers by letting these workers work overtime. According to Article 32, Sections 1 and 2 of the Japanese Labour Standard Act, eight hours per day/40 hours per week is the maximum full-time workload in Japan. If the maximum full-time working hours per month is therefore 160 hours per person, and this is applied to the calculation of base wages (excluding bonuses) among nonregular workers, it can be estimated that the TMC saved approximately USD280,947,437 in base wages during 2008 by hiring nonregular workers. Moreover, according to Article 36, Section 1 of the Japanese Labour Standard Act, there is no legally compulsory restriction on the maximum number of full-time working hours, which means that workers are actually allowed to work overtime; therefore, the TMC's savings increase further if overtime work hours are considered and applied to the calculation of the base wage. Consequently, the more that output increases are

[26] "For example, full-time workers receive child benefits of $18.63 a month for one child, $33.52 for up to three children, and $52.67 for four or more children" (National Labor Committee, 2008, p. 29).

handled by nonregular workers who work overtime—as their labor costs are lower than those of regular workers—the more the TMC can save on wages. This is likely another motivation behind the TMC's use of nonregular workers in manufacturing.

4 Conclusion

In this study, we attempted to uncover the reasons behind the evolution of a corporate system—more specifically, the case of the transformation of the Toyota Group's production and employment structures. Our findings show that the production structure of the Toyota Group—which has been gradually affected by external, market, and institutional factors since the 1980s—fully transformed in 2009 from a DPS to an OPS. We also determined that since 2004, the TMC's domestic employment structure in Japan has evolved to allow the flexible management of worker supply and demand through the hiring of nonregular workers, especially following the amendment to the Worker Dispatching Act.

Companies in the manufacturing sector, and especially in the automobile industry, engage in mass production that is carried out by a large number of workers; as such, they constantly search for channels by which they can adjust their output in response to abrupt economic fluctuations. Because of this, their production and employment structures evolve to help secure such channels. This can be seen in how the production structure of the Toyota Group, which once depended strongly on domestic production, has transformed to one focused on overseas manufacturing—a transformation made through investment and the expansion of overseas facilities in other countries worldwide. The transformation can also be seen in how the TMC has expanded its hiring of nonregular workers as a vehicle for labor cost-cutting and in its flexible adjustment of domestic output, both in response to economic fluctuations.

The production and employment structures of the Toyota Group have constantly evolved in reaction of a variety of factors, but it cannot be overlooked that the direction of evolution in its production and employment structures is partially constrained by institutions and technologies both inside and outside the Toyota Group. Nevertheless, if other new factors were to decisively affect the evolution of the Toyota Group's production and employment structures, they would likely lead to evolution, not previously shown, in other structural forms. This means that the corporate system of the Toyota Group is evolving into one that can effectively or strategically cope with various factors that affect its production and employment structures. Furthermore, such evolution implies that the company has a unique corporate system that is distinct from the diverse systems of other companies.

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